

Name: _____ Date Due: _____

TRUE OR FALSE

State whether each statement is true or false and briefly explain why. If the statement is false, try to “fix” it by modifying the given statement to a new statement that is true.

1. For a graph, you can compute the slope using any two points and get the same value.
2. All graphs must pass the vertical line test.
3. A cubic function has a graph with one local maximum and one local minimum.
4. If f is a trigonometric function, then there is exactly one solution of the equation $f(x) = 1$.
5. The period of the function $\sin(kx)$ is $\frac{2\pi}{k}$.
6. All quadratic functions have graphs that look like the parabola $y = x^2$.

In exercises 7 and 8, find the slope of the line through the given points.

7. $(2, 3), (0, 7)$
8. $(1, 4), (3, 1)$

In exercises 9 and 10, determine whether the lines are parallel, perpendicular, or neither.

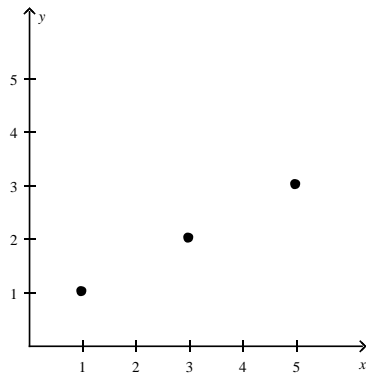
9. $y = 3x + 1$ and $y = 3(x - 2) + 4$

10. $y = -2(x + 1) - 1$ and $y = \frac{1}{2}x + 2$

11. Determine whether the points $(1, 2)$, $(2, 4)$ and $(0, 6)$ form the vertices of a right triangle.

12. The data represent populations at various times. Plot the points, discuss any patterns and predict the population at the next time: $(0, 2100)$, $(1, 3050)$, $(2, 4100)$ and $(3, 5050)$.

13. Find an equation of the line through the points indicated in the graph that follows and compute the y -coordinate corresponding to $x = 4$.



14. For $f(x) = x^2 - 3x - 4$, compute $f(0)$, $f(2)$, and $f(4)$.

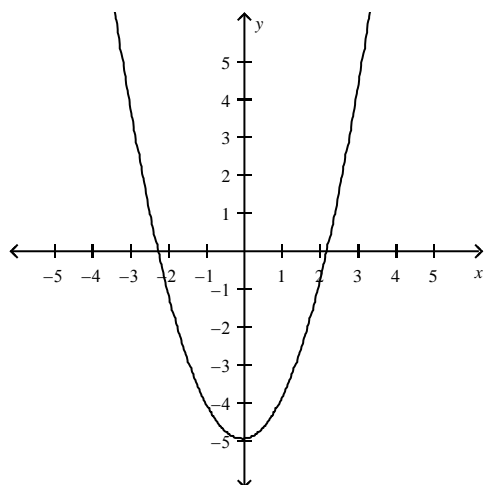
In exercises 15 and 16, find an equation through the line with the given slope and point.

15. $m = -\frac{1}{3}, (-1, -1)$

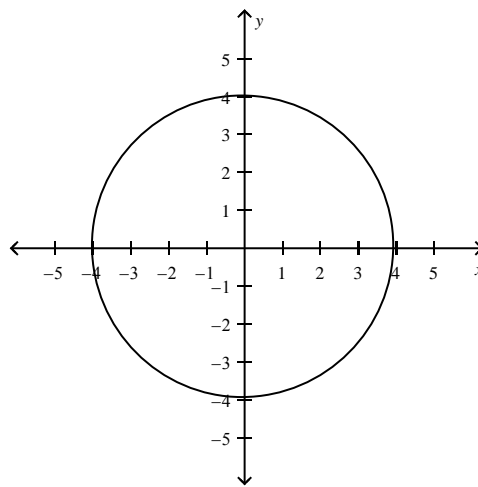
16. $m = \frac{1}{4}, (0, 2)$

In exercises 17 and 18, use the vertical line test to determine whether the curve is the graph of a function.

17.



18.



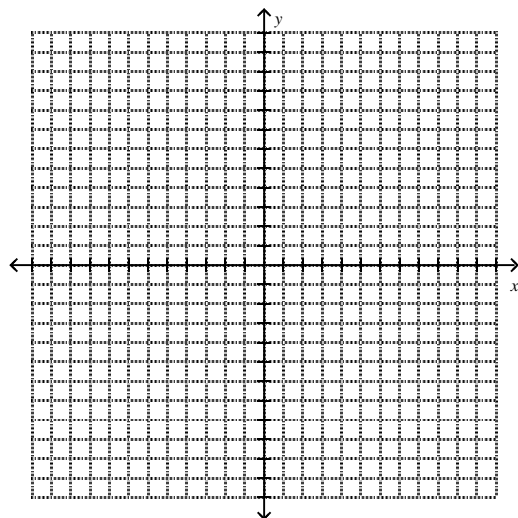
In exercises 19 and 20, find the domain of the given function.

19. $\sqrt{4 - x^2}$

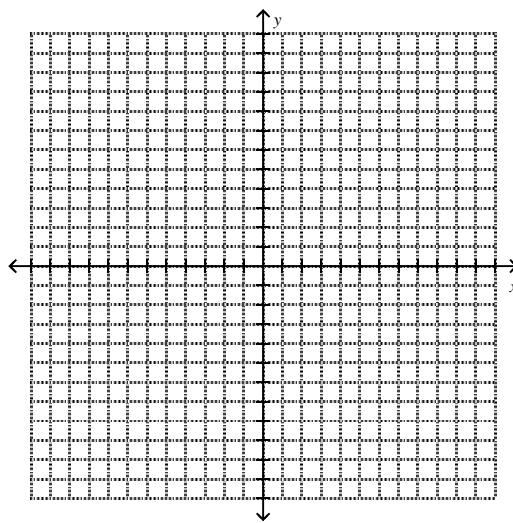
20. $\frac{x-2}{x^2-2}$

In exercises 21-26, sketch a graph of the function showing extrema and vertical asymptotes.

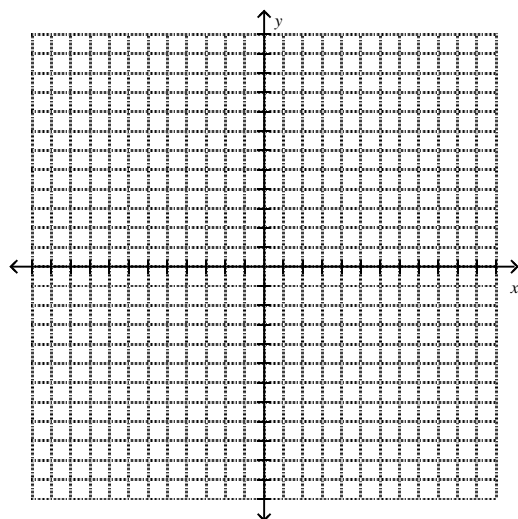
21. $f(x) = x^2 + 2x - 8$



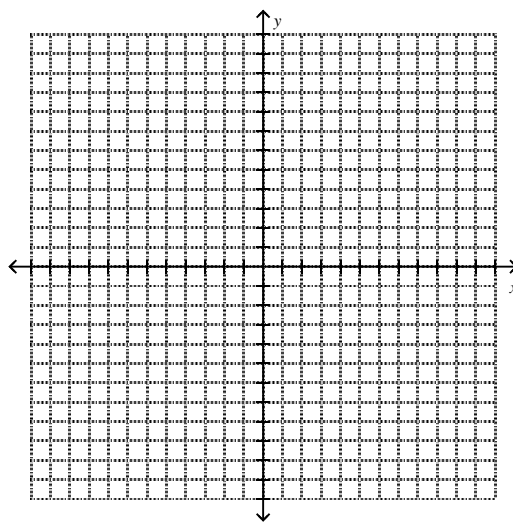
22. $f(x) = x^3 - 6x + 1$



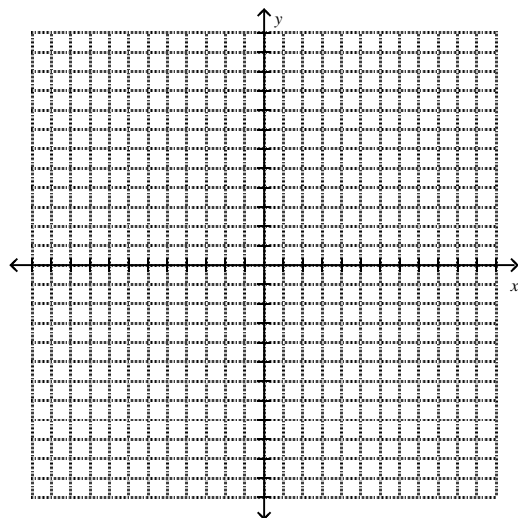
23. $f(x) = x^4 - 2x^2 + 1$



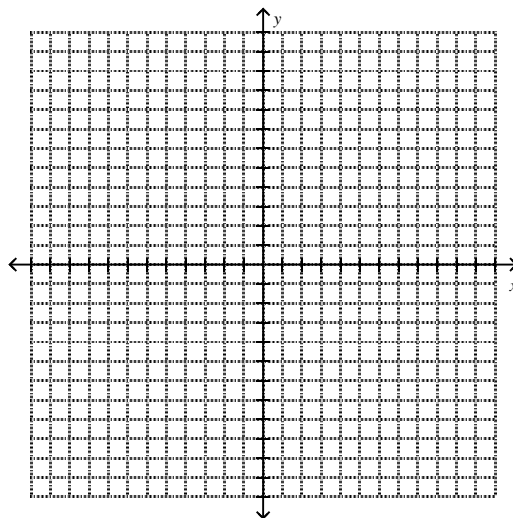
24. $f(x) = x^5 - 4x^3 + x - 1$



25. $f(x) = \frac{4x}{x+2}$



26. $f(x) = \sin 3x$



27. Determine all intercepts of $f(x) = x^2 + 2x - 8$. (Refer to the graph of #21)

28. Determine all intercepts of $f(x) = x^4 - 2x^2 + 1$. (Refer to the graph of #23)

29. Determine all intercepts of $f(x) = \frac{4x}{x+2}$. (Refer to the graph of #25)

In exercises 30-33, find or estimate all zeros of the given function.

30. $x^2 - 3x - 10$

31. $x^3 + 4x^2 + 3x$

32. $x^3 - 3x^2 + 2$

33. $x^4 - 3x - 2$

In exercises 34 and 35, determine the number of solutions.

34. $\sin x = x^3$

35. $\sqrt{x^2 + 1} = x^2 - 1$

36. A surveyor stands 50 feet from a telephone pole and measures an angle of 34° to the top. How tall is the pole?

37. Find $\sin \theta$, given that $0 < \theta < \frac{\pi}{2}$ and $\cos \theta = \frac{1}{5}$.

38. Convert to fractional or root form:

a. $5^{-\frac{1}{2}}$

b. 3^{-2}

39. Convert to exponential form:

a. $\frac{2}{\sqrt{x}}$

b. $\frac{3}{x^2}$

In exercises 40 and 41, find $f \circ g$ and $g \circ f$, and identify their respective domains.

40. $f(x) = x^2$, $g(x) = \sqrt{x-1}$

41. $f(x) = x^2$, $g(x) = \frac{1}{x^2-1}$

In exercises 42 and 43, identify the functions $f(x)$ and $g(x)$ such that $(f \circ g)(x)$ equals the given function.

42. $\cos(3x^2 + 2)$

43. $\sqrt{\sin x + 2}$

In exercises 44 and 45, complete the square and explain how to transform the graph of $y = x^2$ into the graph of the given function.

44. $f(x) = x^2 - 4x + 1$

45. $f(x) = x^2 + 4x + 6$

From this point on, you may or may not know the answers to these questions. Do the BEST that you can do. These questions will only count against you if you CHOOSE NOT to complete the questions.

46. Name 3 common reasons that limits fail to exist:

a.

b.

c.

47. What does the limit tell you about the value of a function?

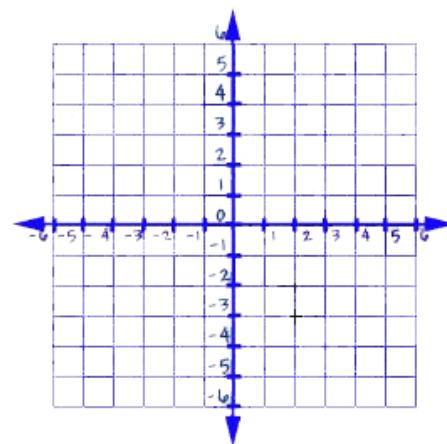
48. Find the following limit by completing the table

$$\lim_{x \rightarrow 0} x^2 - 6$$

x	-0.01	-0.001	-0.0001	0	0.0001	0.001	0.001
$f(x)$							

49. Find the following limit by graphing on your calculator.
Sketch a graph of the function on the coordinate plane provided.

$$\lim_{x \rightarrow 0} \frac{x}{\sqrt{x+1}}$$



Find the following limits using any method, if the limit does not exist state the reason. You do not have to show any work:

50. $\lim_{x \rightarrow 0} \frac{1}{x^2}$

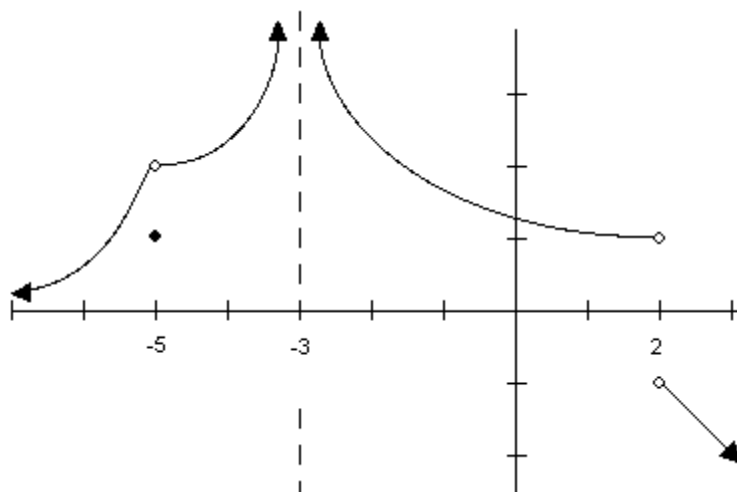
51. $\lim_{x \rightarrow 0} \frac{x^2 - 2x}{x}$

52. $\lim_{x \rightarrow -1} \frac{x^2 - 2x}{x}$

53. $\lim_{x \rightarrow 2} \frac{3x}{x - 2}$

54. $\lim_{x \rightarrow 0} \frac{3x}{x - 2}$

55. Find each limit, if it exists.



a) $\lim_{x \rightarrow -5} f(x) =$

b) $\lim_{x \rightarrow -3} f(x) =$

c) $\lim_{x \rightarrow 2} f(x) =$

d) $\lim_{x \rightarrow 2^+} f(x) =$